

### AMENDMENTS TO THE CLAIMS

#### In the Claims:

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (currently amended) An imaging system, comprising:

a sensor comprising pixels, the pixels having a pixel area of about 0.01 microns<sup>2</sup> or more and about 600 microns<sup>2</sup> or less; and

an image transfer medium having a diffraction limited spot size area in an ~~the~~ object plane of about 0.0003 microns<sup>2</sup> or more and about 600 microns<sup>2</sup> or less, the image transfer medium comprising a first lens positioned toward the object plane and a second lens positioned toward the sensor, the first lens sized to have a focal length smaller than the second lens to provide an apparent reduction of the pixels within the object plane,

wherein pixels projected through the image transfer medium have a projected pixel area in the object plane of about 0.0003 microns<sup>2</sup> or more and about 600 microns<sup>2</sup> or less, the ratio of the projected pixel area in the object plane to the diffraction limited spot size area in the object plane is from about 5:1 to about 1:12.

2. (original) The imaging system of claim 1, wherein the projected pixel area is about 0.001 microns<sup>2</sup> or more and about 200 microns<sup>2</sup> or less, the diffraction limited spot size area is about 0.001 microns<sup>2</sup> or more and about 200 microns<sup>2</sup> or less, and the ratio of the projected pixel area to the diffraction limited spot size area is from about 3.5:1 to about 1:8.

3. (original) The imaging system of claim 1, wherein the projected pixel area is about 0.01 microns<sup>2</sup> or more and about 100 microns<sup>2</sup> or less, the diffraction limited spot size area is about 0.01 microns<sup>2</sup> or more and about 100 microns<sup>2</sup> or less, and the ratio

of the projected pixel area to the diffraction limited spot size area is from about 3:1 to about 1:6.

4. (original) The imaging system of claim 1, wherein the sensor comprises pixels having substantially the same pixel area and substantially the same shape.

5. (original) The imaging system of claim 1, wherein the sensor comprises a first subset of pixels having a first pixel area and a second a subset of pixels having a second pixel area, the first pixel area different from the second pixel area.

6. (currently amended) The imaging system of claim 1, ~~wherein the image transfer medium comprises at least two lenses~~ further comprising an LED illumination source.

7. (original) The imaging system of claim 1, wherein the sensor comprises a plurality of stacked pixels, where each pixel in a stack has substantially the same size.

8. (original) The imaging system of claim 7, wherein each stack of pixels comprises two, three or four pixels.

9. (currently amended) An imaging system, comprising:  
a sensor comprising pixels, the pixels having a pixel pitch of about 0.1 microns or more and about 20 microns or less; and  
an image transfer medium having a diffraction limited spot in an object plane having a diameter of about 0.01 microns or more and about 20 microns or less, the image transfer medium comprising a first lens positioned toward the object plane and a second lens positioned toward the sensor, the first lens sized to have a focal

length smaller than the second lens to provide an apparent reduction of the pixels within the object plane.

wherein pixels projected through the image transfer medium have a projected pixel pitch in the object plane of about 0.01 microns or more and about 20 microns or less, the ratio of the projected pixel pitch in the object plane to the diffraction limited spot diameter in the object plane is from about 1:1.9 to about 1.9:1.

10. (original) The imaging system of claim 9, wherein the projected pixel pitch is about 0.05 microns or more and about 15 microns or less, the diffraction limited spot diameter is about 0.05 microns or more and about 15 microns or less, the ratio of the projected pixel pitch to the diffraction limited spot diameter is from about 1:1.5 to about 1.5:1.

11. (original) The imaging system of claim 9, wherein the projected pixel pitch is about 0.1 microns or more and about 10 microns or less, the diffraction limited spot diameter is about 0.1 microns or more and about 10 microns or less, the ratio of the projected pixel pitch to the diffraction limited spot diameter is from about 1:1.3 to about 1.3:1.

12. (original) The imaging system of claim 9, wherein the image transfer medium comprises an objective lens system and a transfer lens system.

13. (currently amended) The imaging system of claim ~~[[9]]~~ 12, wherein the objective lens system comprises a single objective lens or a plurality of lenses.

14. (original) The imaging system of claim 9, wherein the sensor comprises a plurality of stacked pixels, each pixel in a stack has substantially the same size, and each pixel in a stack captures a different range of wavelengths of light.

15. (original) The imaging system of claim 9, wherein the image transfer medium having a diffraction limited spot in an image plane having a diameter of about 0.1 microns or more and about 20 microns or less, wherein the ratio of the pixel pitch to the diffraction limited spot in the image plane is from about 1:1.25 to about 1.25:1.

16. (currently amended) An imaging system, comprising:

a sensor comprising pixels, the pixels having a pixel width of about 0.1 microns or more and about 20 microns or less; and

an image transfer medium having a diffraction limited spot in an object plane having a diameter of about 0.01 microns or more and about 20 microns or less, the image transfer medium comprising a first lens positioned toward the object plane and a second lens positioned toward the sensor, the first lens sized to have a focal length smaller than the second lens to provide an apparent reduction of the pixels within the object plane,

wherein pixels projected through the image transfer medium have a projected pixel width in the object plane of about 0.01 microns or more and about 20 microns or less, the ratio of the projected pixel width in the object plane to the diffraction limited spot diameter in the object plane is from about 1:1.9 to about 1.9:1.

17. (original) The imaging system of claim 16, wherein the pixels have at least one of a rectangular shape and a square shape.

18. (original) The imaging system of claim 16, wherein the projected pixel width is about 0.05 microns or more and about 15 microns or less, the diffraction limited spot diameter is about 0.05 microns or more and about 15 microns or less, the ratio of the projected pixel width to the diffraction limited spot diameter is from about 1:1.7 to about 1.7:1.

19. (original) The imaging system of claim 16, wherein the projected pixel width is about 0.1 microns or more and about 10 microns or less, the diffraction limited spot diameter is about 0.1 microns or more and about 10 microns or less, the ratio of the projected pixel width to the diffraction limited spot diameter is from about 1:1.2 to about 1.2:1.

20. (original) The imaging system of claim 16 further comprising an illumination source providing at least about 75% of illumination energy having a wavelength range from about 100 nm to about 2,000 nm.

21. (currently amended) The imaging system of claim 1, ~~wherein the image transfer medium comprises a first lens positioned toward the object plane and a second lens positioned toward the sensor, the first lens sized to have a focal length smaller than the second lens to provide an apparent reduction of the one or more pixels within the object field plane~~ further comprising an LED illumination source and at least about 75% of light energy produced by the LED illumination source has a wavelength range from about 100 to about 10,000 nm.

22. (currently amended) The imaging system of claim 9, ~~wherein the image transfer medium comprises a first lens positioned toward the object plane and a second lens positioned toward the sensor, the first lens sized to have a focal length smaller than the second lens to provide an apparent reduction of the one or more pixels within the object field plane~~ further comprising an LED illumination source and at least about 75% of light energy produced by the LED illumination source has a wavelength range from about 400 to about 700 nm.

23. (currently amended) The imaging system of claim 16, ~~wherein the image transfer medium comprises a first lens positioned toward the object plane and a second~~

~~lens positioned toward the sensor, the first lens sized to have a focal length smaller than the second lens to provide an apparent reduction of the one or more pixels within the object plane~~ further comprising an LED illumination source and at least about 75% of light energy produced by the LED illumination source has a wavelength range from about 350 to about 1,000 nm.